# EXHIBIT C

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application

11/231,349

Confirmation No. 4520

Applicant Filed

Brett Bernath 19-Sep-2005

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Examiner

James Leija

For

A BROADBAND LOCAL AREA

NETWORK

Docket No.

05JM-171712

# AMENDMENTS AND REPLY UNDER 37 C.F.R. § 1.114

Mailstop: RCE

Commissioner for Patents

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# INTRODUCTORY COMMENTS

This is in response to the final office action, dated July 18, 2012. Applicant submits the following Request for Continued Examination (RCE) and response. After careful consideration of the grounds for rejections, Applicant respectfully requests that the Examiner reconsider the rejections in view of the discussion submitted.

Amendment to the claims begins on page 2 of this paper.

Remarks begin on page 10 of this paper.

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### AMENDMENT TO THE CLAIMS

(Currently Amended) A Broadband Coaxial Network ("BCN"), comprising:

 a first BCN modem in signal communication with a coaxial cable network ("CCN"), the
 first BCN modem including a first controller; and

a second BCN modern in signal communication with the CCN including a second controller,

wherein each of the first and second controllers [[are]] is configured to probe at least one respective communication link connecting that controller directly to at least one other BCN modem and to adjust transmission power and bit loading over the at least one respective communication link based on a result of the probe;

wherein one of the first and second controllers is a network controller configured to coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN; and

wherein the BCN provides both best effort capabilities in which short term requests are made and time allocation grants to transmit packets received by a BCN modern, and reserved communications capabilities in which long term requests are made and a specific allocation is granted for a certain data rate.

#### 2-3. (Canceled)

- 4. (Previously Presented) The BCN of claim 1, wherein the second controller is configured to detect a control signal that identifies that the network controller is coupled to the CCN.
- (Original) The BCN of claim 1, wherein the signal communication occurs between the BCN modems that are located within a building.
- 6. (Original) The BCN of claim 5, wherein the building is a single family home.
- 7. (Original) The BCN of claim 5 wherein the building is a multi-unit dwelling unit.

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(Previously Presented) The BCN of claim 1, wherein the signal communication occurs
via a Time Division Multiple Access (TDMA) access scheme on one or more Radio
Frequency (RF) channels.

- (Original) The BCN network of claim 1, wherein the signal communication carries encrypted data between the first BCN modem and the other BCN modem.
- 10. (Previously Presented) A Broadband Coaxial Network ("BCN") for communicating on an in-building coaxial cable network ("CCN"), comprising:

a first BCN modem connected to a coaxial cable network ("CCN") and included in a plurality of BCN modems in the BCN network, the first BCN modem including a controller having communication links to ones of the plurality of BCN modems and configured to manage data transmission between each of the BCN modems in the BCN network; and

another of the plurality of BCN modems connected to the CCN and capable of signal communication with the first BCN modem including a second controller having communication links to ones of the plurality of BCN modems,

wherein each of the controllers is configured to periodically probe each of their communication links to other BCN modems and to adjust transmission power over each of the communication links based on the probe through orthogonal frequency division multiplexing (OFDM) and bit-loading;

wherein the first controller establishes the first BCN modem as a network controller (NC) upon connection to the CCN, the network controller configured to coordinate the assignment of time slots during which data transmission between each of the BCN modems connected to the CCN occur, the BCN provides both best effort capabilities in which short term requests are made by at least one BCN modem and time allocation grants to transmit packets are provided by the first BCN modem, and reserved communications capabilities in which long term requests are made by at least one BCN modem and a specific allocation is granted for a certain data rate by the first BCN modem; and

wherein the NC is configured to coordinate the admission of other BCN modems to the CCN without disrupting data transmission between the plurality of BCN modems.

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11. (Previously Presented) The BCN of claim 10, wherein the first BCN modem employs adaptive communication techniques that adapt to the characteristics of a coaxial channel

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between the first BCN modem and the other BCN modem.

12. (Previously Presented) The BCN of claim 10, wherein the first BCN modem is directly in

signal communication with the other BCN modem across the CCN.

13. (Original) The BCN of claim 12 wherein the CCN is a type of network having an

architectural configuration selected from a group consisting of a star configuration and a

mesh configuration and a combination of these configurations, in a TDMA, TDD access

fashion, and the type of network utilizes at least one frequency channel.

14. (Previously Presented) The BCN of claim 11, wherein the adaptive communication

techniques includes utilization of the adaptive communication techniques in both

transmitting processing and receiving processing of data.

15. (Original) The BCN of claim 14, wherein the adaptive communication techniques utilize

pre-coding for transmitting processing.

16. (Original) The BCN of claim 14, wherein the adaptive communication techniques utilize

adaptive equalization for receiving processing.

17. (Original) The BCN of claim 14, wherein the adaptive communication techniques include

pre-coding for transmitting processing based on known or learned channel response.

18. (Original) The BCN of claim 14, wherein additional signal processing techniques are

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used which are selected from a group consisting of OFDM bit-loading, transmit power

control, transmission diversity, OFDM cyclic prefix, and probes.

19-20. (Canceled)

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21. (Previously Presented) The BCN of claim 10, wherein the NC includes a configuration selected from the group consisting of:

a configuration that enables every BCN modem to act as a NC:

a configuration that utilizes a frequency plan;

a configuration that allows a new BCN modem admission to the BCN Network;

a configuration that allows a new BCN modem to communicate with another BCN modem to characterize the channel response between them and determine a bit loading in either direction; and

a configuration that allows each BCN modem in the network to request and be granted a transmission opportunity without a transmission conflict.

22. (Original) The BCN of claim 21, wherein the communications services provided by the BCN include BCN wide transmission priorities.

23. (Canceled)

24. (Previously Presented) The BCN of claim 10, wherein the BCN modern provides a protocol adaptation layer for communication over the BCN, the protocol adaptation layer utilizes protocols selected from the group consisting of:

Ethernet,

IEEE 1394.

Universal Serial Bus ("USB"); and

MPEG-TS.

25. (Original) The BCN of claim 11, wherein the BCN modem is embedded as a part of a device selected from the group consisting of:

a set-top box ("STB");

a Personal Computer (PC);

an IP STB;

a Media Center box;

a Media Extender box:

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a DVD player;

a cable modem;

a personal video recorder ("PVR");

a TV set;

a networking device;

a switch/router:

a bridge/Gateway;

a video game console;

a wireless access point (WAP); and

a network attached storage.

- 26. (Previously Presented) The BCN of claim 11, wherein the BCN modem is a device selected from the group consisting of a satellite STB, cable STB, and DSL STB.
- 27. (Original) The BCN of claim 25, wherein the BCN modern utilizes the PCI bus structure.
- 28. (Original) The BCN of claim 27, wherein the BCN modern utilizes another host device.
- 29. (Original) The BCN of claim 28, wherein the host device is either a bridging host device or a switching host device.
- 30. (Original) The BCN of claim 10, wherein an at least one TDMA frequency channel used by the BCN network is in one or more of the following frequency bands:

above 860 MHz;

between 860 MHz and 950 MHz; and

below 50 MHz.

31. (Original) The BCN of claim 10, wherein the CCN network is one of the following: coaxial cables that have been installed for the carriage of satellite signals; and coaxial cables for video distribution.

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32. (Previously Presented) A network device, comprising:

a communication interface configured to connect to a broadband coaxial network ("BCN"); and

a controller in signal communication with the communication interface, the controller configured to:

periodically probe a communication link to another network device to determine a characteristic of the communication link;

use orthogonal frequency division multiplexing and bit-loading to adjust transmissions over each communication link based in part on the probe;

manage data transmission between each network device connected to the BCN by assigning time slots during which data transmission between each of the network devices occur;

provide both best effort capabilities in which short term requests are made by at least one BCN modem and time allocation grants to transmit packets are provided by the controller, and reserved communications capabilities in which long term requests are made by at least one BCN modem and a specific allocation is granted for a certain data rate by the controller; and

coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN.

- 33. (Previously Presented) The BCN of claim 1, wherein the network controller is configured to periodically broadcast a packet of a first type to each BCN modem connected to the CCN using a lower order modulation than an order of modulation used by BCN modems to transmit packets of a second type directly between each other.
- 34. (New) A broadcasting method within a Broadband Coaxial Network ("BCN"), comprising:

a transmitting node transmitting a probe signal to a plurality of receiving nodes; the transmitting node receiving a plurality of response signals comprising a plurality of bit-loading modulation schemes from the plurality of receiving nodes, wherein each of the plurality of receiving nodes

receives the probe signal through a corresponding channel path,

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determines transmission characteristics of the corresponding channel path,
determines a bit-loading modulation scheme for the corresponding channel path
based on the transmission characteristics, and

transmits a response signal to the transmitting node informing the transmitting node of the bit-loading modulation scheme for the corresponding channel path; the transmitting node comparing the plurality of bit-loading modulation schemes to determine a common bit-loading modulation scheme; and the transmitting node transmitting a broadcast signal relaying the common bit-loading modulation scheme to the plurality of receiving nodes.

- 35. (New) The broadcasting method within the BCN of claim 34, wherein the broadcast signal comprises handshake data.
- 36. (New) The broadcasting method within the BCN of claim 34, wherein the broadcast signal is a communication message comprising video data, music data, or voice data.
- 37. (New) The broadcasting method within the BCN of claim 34, wherein each node of the BCN determines a respective common bit-loading modulation scheme for broadcasting to the other nodes of the BCN.
- 38. (New) The broadcasting method within the BCN of claim 34, further comprising the transmitting node broadcasting a signal based on the common bit-loading modulation scheme to the plurality of receiving nodes simultaneously.
- 39. (New) A Broadband Coaxial Network ("BCN") comprising a first BCN modern comprising a first controller; and a plurality of BCN moderns comprising a plurality of controllers; wherein the first controller is configured to transmit a probe signal to the plurality of controllers,

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receive a plurality of response signals comprising a plurality of bit-loading modulation schemes from the plurality of controllers, wherein each of the plurality of controllers is configured to

receive the probe signal through a corresponding channel path,
determine transmission characteristics of the corresponding channel path,
determine a bit-loading modulation scheme for the corresponding channel
path based on the transmission characteristics, and

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transmit a response signal to the first controller informing the first controller of the bit-loading modulation scheme for the corresponding channel path,

compare the plurality of bit-loading modulation schemes to determine a common bit-loading modulation scheme, and

transmit a broadcast signal relaying the common bit-loading modulation scheme to the plurality of controllers.

- 40. (New) The BCN of claim 39, wherein the broadcast signal comprises handshake data.
- 41. (New) The BCN of claim 39, wherein the broadcast signal is a communication message comprising video data, music data, or voice data.
- 42. (New) The BCN of claim 39, wherein each controller of the plurality of controllers determines a respective common bit-loading modulation scheme for broadcasting to the other controllers of the plurality of controllers and the first controller.
- 43. (New) The BCN of claim 39, wherein the first controller is further configured to broadcast a signal based on the common bit-loading modulation scheme to the plurality of controllers simultaneously.

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# **REMARKS**

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Claims 1 is amended. Claims 34-43 are new. No new matter is added. As a result, claims 1, 4-18, 21-22, and 24-43 are pending in this application.

## Newly Added Claims

Applicant has added new claims 34-43. Support for these claims may be found at least in paragraphs 104-109 and 117-119, and Figures 9, 12, 13A-13C, and 19 of the specification.

Applicant respectfully requests entry of the newly added claims.

# Priority

Independent claims 1, 10, and 32 are indicated as not being supported by the disclosure of the prior-filed provisional applications: Application No. 60/633091, Application No. 60/632797, Application No. 60/633002, and Application No. 60/632856. Applicant respectfully submits that at least one of the prior-filed applications provides adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. § 112.

Independent claims 1, 10, and 32 recite, in part, "a network controller configured to coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN." Support for this limitation exists, at least, in paragraphs 50-52 and 64 of the prior-filed provisional application Application No. 60/632797.

Paragraphs 50-52 describe admission of a BCN modern. Paragraph 50 explains that "one of the BCN moderns is assigned as the Network Controller ("NC") and provides all the necessary information allowing other BCN moderns to be admitted to the network, adapt to the network characteristics, synchronize to the network timing and framing, make transmission requests and be able to communicate with some or all of the other BCN moderns in the network."

Accordingly, one of ordinary skill in the art would understand that one BCN modern is assigned as the NC to coordinate admission of other BCN moderns, as claimed in claims 1, 10, and 32.

The specification also describes that this is done without disrupting data transmission in the network. For example, paragraph 51 further describes that "[t]he NC provides network timing synchronization including the timing of admission area for slave BCN modems." This timing of admission is communicated to the BCN modem requesting to be admitted to the

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network in the form of a beacon. Paragraph 51 provides such description. For example, before being admitted to a network, a BCN modem "locate[s] the network timing by receiving a beacon identifying network timing and essential network control information including network admission area, and other information identifying the time location and characteristics of other important and valid information such as future beacon locations, future channel assignment information." Accordingly, one of ordinary skill in the art would recognize that this is done to avoid disruption of data transmission in a network, as claimed in claims 1, 10, and 32.

Additionally, the specification describes that the NC controls timing of communication in a network and manages the network including admission of a BCN modem. For example, paragraph 64 describes the responsibilities of a NC BCN modem. The NC BCN modem manages the other clients' BCN access to the network, coordinates assignment of time slots for all BCN modems within a network, and provides synchronization and timing to the other BCN modems in the network. Moreover, paragraph 52 explains that the steps of a network admission process are under the direction of the NC BCN modem. One of the steps of a network admission process is "the optimization of the transmission characteristics between the BCN modem and any of the other BCN modems already in the network." The NC BCN modem assigns timeslots to the BCN modem to make requests for transmission opportunities to enable the communication between the slave BCN modem and each of the other nodes in the network. One of ordinary skill in the art would understand that the NC BCN modem manages both data transmission in a network and admission of a new BCN modem to the network.

From the disclosure of the above-mentioned paragraphs, it is clear that a NC BCN modern manages both data transmission among existing BCN moderns of a network and admission of a BCN modern into the network such that admission of a new BCN modern does not disrupt the data transmission in the network. One of ordinary skill in the art would understand that admission of a new BCN modern to a network is coordinated by the NC BCN modern and does not disrupt data transmission in the network. Accordingly, the provisional application Application No. 60/632797 provides support for the claim limitation "a network controller configured to coordinate the admission of other BCN moderns to the CCN without disrupting data transmission in the CCN," as recited in claims 1, 10, and 32.

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In view of the above, Applicant respectfully submits that claims 1, 10, and 32 as well as their dependents, claims 4-9, 11-18, 21-22, 24-31, and 33, can claim priority to the priority date, <u>December 2, 2004</u>, of the provisional application Application No. 60/632797.

Claim Rejections - 35 U.S.C. § 103

Claims 1, 4-9, and 33

Claims 1, 4, 5, and 6

Claims 1, 4, 5, and 6 are rejected as being unpatentable over Dinwiddie et al. (USPN 6,481,013) and further in view of Bell (USPN 6,052,380), Emerson et al (US 2003/0091067), and Padwekar (US 2006/0221819). Applicant respectfully traverses the rejections as follows.

Claim 1 recites, in part, "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN." None of Dinwiddie, Bell, Emerson, and Padwekar discloses, teaches, or suggests the cited claim limitation.

The Office Action acknowledges that Dinwiddie fails to teach or suggest the above-noted claim limitation. (See the Office Action, pages 8). As noted in the previous submissions, both Bell and Emerson fail to cure the noted deficiency of Dinwiddie as they are silent with respect to the noted claim limitation.

The Office Action alleges that Padwekar cures this deficiency. (See the Office Action, pages 8). However, Padwekar fails to cure the noted deficiency because Padwekar is not prior art under 35 U.S.C. § 103. Padwekar was filed on March 30, 2005, which was later than December 2, 2004, the filing date of the provisional application Application No. 60/632797, to which the present application claims priority.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claim 1 and its dependents, claims 4, 5, and 6, as being unpatentable over Dinwiddie further in view of Bell, Emerson, and Padwekar under 35 U.S.C. § 103(a).

Claim 7

Claim 7 is rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, and Padwekar, and further in view of El Wardani et al. (U.S. Pub. No. 2003/0031191) ("El Wardani"). Applicant respectfully traverses the rejection as follows.

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Claim 7 depends from claim 1. As stated above, Dinwiddie, Bell, Emerson and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 1. As noted in the previous submissions, El Wardani fails to cure the deficiencies of Dinwiddie, Bell, Emerson, and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejection of claim 7 as being unpatentable over Dinwiddie, Bell, Emerson, El Wardani, and Padwekar under 35 U.S.C. § 103(a).

#### Claim 8

Claim 8 is rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, and Padwekar, and further in view of Gurantz et al. (U.S. Pub. No. 2002/0166124) ("Gurantz").

Applicant respectfully traverses the rejection as follows.

Claim 8 depends from claim 1. As stated above, Dinwiddie, Bell, Emerson and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 1. As noted in the previous submissions, Gurantz fails to cure the deficiencies of Dinwiddie, Bell, Emerson, and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejection of claim 8 as being unpatentable over Dinwiddie, Bell, Emerson, Gurantz, and Padwekar under 35 U.S.C. § 103(a).

#### Claim 9

Claim 9 is rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, and Padwekar, and further in view of Droge et al. (U.S. Pub. No. 2002/00004898) ("Droge").

Applicant respectfully traverses the rejection as follows.

Claim 9 depends from claim 1. As stated above, Dinwiddie, Bell, Emerson, and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 1. As noted in the previous submissions, Droge fails to cure the deficiencies of Dinwiddie, Bell, Emerson, and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejection of claim 9 as being unpatentable over Dinwiddie, Bell, Emerson, Droge, and Padwekar under 35 U.S.C. § 103(a).

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Claim 33

Claim 33 is rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, and Padwekar, and further in view of Gurney et al. (U.S. Pub. No. 2005/0175123) ("Gurney").

Applicant respectfully traverses the rejection as follows.

Claim 33 depends from claim 1. As stated above, Dinwiddie, Bell, Emerson, and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 1. As noted in the previous submissions, Gurney fails to cure the deficiencies of Dinwiddie, Bell, Emerson, and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejection of claim 33 as being unpatentable over Dinwiddie, Bell, Emerson, Gurney, and Padwekar under 35 U.S.C. § 103(a).

# Claims 10-18, 21-22, and 24-31

Claims 10-12, 14, 15, 17, and 31

Claims 10-12, 14, 15, 17, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (USPN 6,481,013) and further in view of and Bell (USPN 6,052,380), and Silverman (USPN 6,307,862), and Emerson et al (US 2003/0091067) and Padwekar (US 2006/0221819). Applicant respectfully traverses the rejections as follows.

Claim 10 recites, in part, "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN." As noted in the previous submissions, Silverman fails to cure the deficiencies of Dinwiddie, Bell, Emerson, and Padwekar with respect to this claim limitation. Accordingly, for the reasons provided above with respect to claim 1, Applicant respectfully requests withdrawal of the rejections of claim 10 and its dependents, claims 11–12, 14, 15, 17, and 31, as being unpatentable over Dinwiddie, Bell, Emerson, Silverman, and Padwekar under 35 U.S.C. § 103(a).

Claims 13, 18, and 26

Claims 13, 18, and 26 are rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, Silverman and Padwekar, and further in view of Gurantz. Applicant respectfully traverses the rejections as follows.

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Claims 13, 18, and 26 depend from claim 10. As stated above, Dinwiddie, Bell, Silverman, Emerson and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 10. As noted in the previous submissions, Gurantz fails to cure the deficiencies of Dinwiddie, Bell, Silverman, Emerson, and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 13, 18, and 26 as being unpatentable over Dinwiddie, Bell, Emerson, Silverman, Gurantz, and Padwekar under 35 U.S.C. § 103(a).

Claims 16, 25, and 27-30

Claims 16, 25, and 27-30 are rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, Silverman, and Padwekar, and further in view of El Wardani. Applicant respectfully traverses the rejections as follows.

Claims 16, 25, and 27-30 depend from claim 10. As stated above, Dinwiddie, Bell, Silverman, Emerson and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 10. As noted in the previous submissions, El Wardani fails to cure the deficiencies of Dinwiddie, Bell, Silverman, Emerson and Padwekar with respect to this claim limitation. Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 16, 25, and 27-30 as being unpatentable over Dinwiddie, Bell, Emerson, Silverman, El Wardani and Padwekar under 35 U.S.C. § 103(a).

Claims 21, 22, and 24

Claims 21, 22, and 24 are rejected as being unpatentable over Dinwiddie in view of Bell, Emerson, Silverman, and Padwekar, and further in view of Gorman (U.S. Patent No. 6,137,793). Applicant respectfully traverses the rejections as follows.

Claims 21, 22, and 24 depend from claim 10. As stated above, Dinwiddie, Bell, Silverman, Emerson, and Padwekar fail to teach or suggest the claim limitation "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN," as recited in claim 10. As noted in the previous submissions, Gorman fails to cure the deficiencies of Dinwiddie, Bell, Silverman, Emerson and Padwekar with respect to this claim

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limitation. Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 21, 22, and 24 as being unpatentable over Dinwiddie, Bell, Emerson, Silverman, Gorman, and Padwekar under 35 U.S.C. § 103(a).

## Claim 32

Claim 32 is under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Dinwiddie, Silverman, and Padwekar. Applicant respectfully traverses the rejection as follows.

Claim 32 recites, in part, "coordinate the admission of other BCN modems to the CCN without disrupting data transmission in the CCN." For the reasons provided above with respect to claims 1 and 10, Applicant respectfully requests withdrawal of the rejection of claim 32 as being unpatentable over Bell in view of Dinwiddie, Silverman, and Padwekar under 35 U.S.C. § 103(a).

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# CONCLUSION

The foregoing amendments should place this application in condition for allowance. Timely issuance is respectfully requested. If any matters remain outstanding after consideration of this Amendment that the Examiner believes might be expedited by a telephone conference with Applicant's representative, the Examiner is respectfully requested to call the undersigned attorney at the number indicated below.

Any fees due in connection with the filing of this Amendment should be charged to Deposit Account No. 50-4562 referencing docket 05JM-171712. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: October 18, 2012

Respectfully submitted,

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